

Effective communication of microbial control research to encourage the setting of appropriate policies: Who should be engaged, and how? **Mrill Ingram**, Department of Geography, University of Wisconsin, Madison, WI.

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### **Social Networks of Microbial Biocontrol**

In answering the question of how to encourage the setting of appropriate policy it is useful to think very broadly about existing networks of people working with microbes that could be important in facilitating the building of public trust in new technologies and in setting good policy via a participatory process.

While there is a general “antimicrobial” attitude in society, more specifically there are many groups of professionals who work with microbes on a daily basis, and as a result have a more discerning understanding about different types of microbes, and may also be able to more clearly comprehend the ecological approach of using microbes in order to combat pests. These are also likely to be groups with specific concerns about microbial technologies, rather than vague fears.

**Social networks** can be a useful approach in both the development of new technologies as well as of relevant policies. Analyzing the social networks of microbial biocontrol involves:

- **Mapping** existing networks: What groups in society may be more familiar with microbial technologies, how are those groups organized, how do members communicate, and what might be their main interests and concerns. What are current challenges, attitudes, and successes? How might different groups respond to specific microbial technologies?

“Publics” with professional, and often complex relationships with microbes include organic and other alternative farmers, who are accustomed to an ecological perspective on environmental management that includes working with microbes in pest management (Bt), soil and compost building, and even cheese making. These groups will also be concerned about gmos (federal regulations prohibit the use of gmos in organic agriculture), and the overuse of a microbial pest control such that pests develop resistance. Land managers and others pursuing ecological restoration tend to be trained in ecological sciences (Cabin et al. 2010), and like organic farmers will be accustomed to management-intensive technologies. They will be keen on new approaches to invasive species control but will likely have concerns about the introduction and containment of non-native organisms.

- Pursuing a “**gap analysis**.” What types of new or changed relationships, or links in social networks of microbial biocontrol, may be critical to the successful application of new technologies and appropriate policy? How will people learn about new applications, and how will any questions be answered? What kind of outreach and education will assist in creating positive connections?

- **Involving and educating** a diverse range of stakeholders: Seek out existing networks and foster participation *within* the technology R&D process as well as the policy making process (Warner et al. 2008, Sheppard et al. 2003). This involves taking advantage of existing social networks for farmer education and certification, for example, regulatory networks such as the USDA National Organic Standards Board (NOSB), and educational and research networks such as the USDA-Sustainable Agriculture Research and Education program.

Resources need to be sufficient to create organizations to pursue vigorous public outreach, and also to support credible handling of public issues and concerns. Such organizations can both protect core science and also build public trust through adequate representation and legitimate science-backed responses to questions about the environmental and human impacts of a technology. Another benefit is that research on the impact of a technology is not relegated “downstream” and viewed as less valuable “applied” research. Examples of such organizations include the International Committee On Nanotechnology (McCarthy & Welty 2010) and also the NOSB (Ingram 2007).

These experiences suggest that good policy will require sufficiently funded institutions that are broad-based, multi-stakeholder arenas, providing “cloaks” for people to communicate who are typically at odds (e.g. industry and environmentalists), and also closely linked to scientists generating data so that there is real data in any public discussion or controversy. In addition, regulatory processes will be informed by the work of these groups such that public input is taken seriously and responded to, and at the same time the science itself is protected and furthered.

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